

Remarks in Support of Patentability

In response to the objections raised in point 1 of the office action under 35 USC § 112, applicant has further amended claims 1, 5, 11 and 12. The amendments take account of the examiner's double inclusion objection and also further clarify the patentable nature of the blank and the support that are the subject of the claims. Basis for the amendments to claims 11 and 12 in relation to the side walls is provided by Figures 1 and 3 in combination with the description of the box on page 2, paragraph 0024.

In response to the rejections under 35 USC § 103, applicant submits that this application is directed to a corrugated cardboard support. A fundamental difference exists between the support of the current application and the prior art cited in the official action. The support of the invention is not designed to be a container; it has been designed to act as a support and hence has different properties, characteristics and requirements as compared to the prior art cited. All of the prior art references cited in the office action disclose boxes, containers or cartons, not supports.

The corrugated cardboard support of the invention is prepared from a corrugated cardboard blank, which is also a part of the invention. The blank is formed into the support by an automatic folding and gluing machine operating at over 16,000 blanks per hour. It is therefore essential that the blank is capable of being manipulated by folding and then being glued at speed, yet still retaining the strength required of the support of this invention.

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Once the corrugated cardboard blank has been folded and glued, it is forced into an erect state. The action of forcing the blank into this erect state has the result that the end flaps (11, 22, 14 and 25) forming the end panels of the support are locked into place. Consequently, it is not possible to collapse the support back into a folded state. Any attempt to subsequently collapse the support again results in damage and/or complete destruction of the support.

It is an essential feature of the support that the end flaps of the support can be locked into place to form a so-called 'crash-lock base'. The shape and arrangement of the end flaps not only locks the end panels of the support in place but also imparts substantial strength to the support.

Once erected each support is capable of withstanding forces of the order of 250 kg. If too much force is applied to the support, damage to the support usually occurs by way of breaking of the locking tabs or deformation of the walls. Therefore, when a number of supports are, for example, utilized as the supports in a corrugated cardboard pallet, the pallet is capable of withstanding forces in the neighborhood of 2,250 kg, a surprising and unexpected effect for a support made of cardboard.

A great deal of the strength of the corrugated cardboard supports is attributable to the shape and arrangement of the end panels (numbered 11, 22, 14 and 25), the tabs (numbered 12, 23, 15 and 26) located on each of the side flaps, and also to the shape of the indent on each of the side flaps. In the invention, it is essential that the shape of the indent on one of the side flaps has a rounded surface and the indent on the opposing side flap has an angular surface. Only with this combination of rounded and

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angular shaped indents can suitable locking of the side flaps be achieved so as to obtain the strong, locked end panels of the support.

If the shape of the side flaps is incorrect, then when the support is erected and a load applied to the support, the end panels of the support will not sufficiently lock, resulting in collapse of the support.

In the invention flaps 11 and 22 possess a relatively large right-angled notch, and flaps 14 and 25 possess a relatively large quadrant shaped notch. This arrangement of flaps and notches allows the construction of a support despite the frictional resistance that arises when the flaps 11 and 14 and 22 and 25 co-operate during erection. The notches are shaped in such a way and have sufficient depth to provide a deep locking arrangement between the flaps that effectively tear into one another if one attempts to collapse the support. In addition, the sizes of side flaps 11, 13, 14, and 16, and 22, 24, 25 and 27 are selected to provide the most effective frictional forces to oppose collapse of the erect support while also providing a substantial gluing area.

The rejections raised in paragraphs 3, 4, 5, 6 and 7:

In paragraph 3, the Examiner has rejected claims 1,2,4-9 and 11 under 35 U.S.C.103(a) as allegedly being unpatentable over Ringer in view of either Weaver or Forbes Jr.

In contrast to the present invention, Ringer describes a collapsible liquid container that can be erected and collapsed. The collapsible container in Ringer carries an impermeable bag capable of holding liquids. The resultant container in Ringer

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cannot be made automatically on a gluing machine. The purpose of the end panels (31 in Fig. 1) in Ringer is merely to contain the liquid filled bag. Fig. 2 of Ringer illustrates a blank of the container and depicts notched indents 26a and 28a. The nature of these indents is such that they are only sufficient to hold the end panels of the carton together until such times as the bag is inserted into the carton and filled. It is clear from Ringer that without a liquid infill, the carton would collapse to its flattened form once pressure was applied to the top panel.

In addition, Fig. 1 of Ringer illustrates an end closure arrangement. This is distinct from the current invention in which the side flaps interlock to form a crash-lock design (see Figure 2 of the present application). Ringer discloses a typical "X" shaped closure system with only a small region of overlap of the notched side flaps. Ringer therefore allows the container to be easily erected and collapsed.

In contrast, the blank and hence the support of the current invention comprises particularly long right-angled notched side flaps and quadrant shaped notched side flaps. To form an end panel or wall, a right-angled notched side flap (either 11 or 22) cooperates with and locks with a quadrant shaped notched side flap (either 14 or 25). The interaction of the two differently shaped notched side flaps forms a particularly strong crash-lock type end panel that is able to withstand considerable tensile strength when the support is erect, so much so that it cannot be collapsed unless physically damaged.

If one contrasts Fig. 2 of Ringer with Fig. 1 of the current application one can see that the designs of the side flaps forming the end panels are completely different. The

container in Ringer is not designed with side flaps that are capable of locking and withstanding compressive or tensile strength. In Ringer, the carton has merely a means of automatic end closure achieved when two diametrically opposed corners of the main sides are pushed together. Once the carton in Ringer is erect, if one were to apply gentle pressure to opposing corners, the carton would collapse rapidly and lie flat again. This ease of opening and collapse in Ringer is achieved as a result of the notches 26a and 28a on the side flaps being small and the same shape, thereby providing very little contact area and allowing the side flaps to slide over each other to close but equally allowing the side flaps to slide over each other to open.

Contrasting, in the present invention, the size, shape and orientation of the side flaps, 11, 22, 14 and 25, the nature of the indents I, notches on the side flaps, and the nature of the tabs 12, 15, 23 and 26 allows a support to be constructed that comprises a crash-lock panel on two opposing side walls that when in place in an erected support, cannot be collapsed again without damaging the support. The blank in the present invention has two pairs of differently shaped side flaps that form opposing side walls of the support. The side flaps have differently shaped indents, namely a rounded region and an angular region. The shape of the side flaps and indents ensures that with the application of pressure to the side flaps, the flaps can be made to interact and lock together to form a secure locked panel. In the present invention, the side flaps, notches and indents are shaped such that the side flaps can slide over each other with resistance to close but which cannot slide over each other again to open. Consequently, the support of the present invention with the locked side panels is capable of withstanding heavy loads once erect.

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There is no teaching in Ringer of obtaining a support. Likewise, there is no teaching in Ringer of a support that can be formed with double crash-lock side panels. Furthermore, there is no teaching in Ringer of how to construct and shape side flaps to form panels that can slide over each other to lock, but which cannot slide over each other again to be re-opened without destroying the support.

In Weaver, there is disclosed a paperboard carton and blank for making same which produces a tamper proof top locking closure system to retain its contents. As stated in column 2 lines 22-24, an object of Weaver is to provide a carton that can be easily opened and readily re-closed.

The aim of Weaver is to produce a carton for a completely different purpose than the support of the present invention. There is no teaching in Weaver of how to provide a support. Weaver does not disclose a support with a double crash lock system formed from panels as in the present invention. The base of the carton shown in Fig. 1 of Weaver discloses rounded flaps at 47 and 59. This rounded arrangement of the end flaps forming the wall of the carton enables the carton to be erected and then collapsed readily. There is no teaching in Weaver of a support with an end closure system formed from two differently shaped side flaps that will engage and lock together permanently when the structure is erected.

Forbes discloses a telescoping carton adapted for packaging food products. Figure 1 of Forbes illustrates flaps 22 and 24 that are shaped as rounded quadrants so as to reduce friction and enhance erection and collapse of the carton. Figure 4 further illustrates the sinusoidal nature of the interlock of the side flaps. The end panels formed

from flaps 22 and 24 do not in effect lock, they slide into place when the carton is in an erect form, and easily slide apart again when the carton needs to be collapsed. This is in contrast to the permanently locked crash-lock system illustrated in Fig. 2 of the present application.

Therefore, starting with Ringer there is no teaching in Ringer in view of either Weaver or Forbes from which one of ordinary skill in the art would produce a support with permanently locked side panels. Furthermore, there is no teaching in Ringer in view of either Weaver or Forbes from which one of ordinary skill in the art would produce a support with permanently locked end panels, achieved by forming a panel from flaps, wherein one of the flaps on the end-panel is curved and the other flap on the end-panel which has an angular surface, thereby producing a support capable of withstanding a considerable load bearing force.

Therefore, it is submitted that claims 1, 2, 4-9 and 11 are patentable over Ringer in view of either Weaver or Forbes Jr. as this combination of references does not teach or suggest a support in which the end-panels engage and then are incapable of disengaging.

In paragraph 4, the Examiner has rejected claims 1,2,4-9 and 11 under 35 U.S.C.103(a) as being unpatentable over Henry, or Ward in view of Single and either Weaver or Forbes.

Henry discloses a paperboard or plastic self-forming storage carton that can be erected and again collapsed (column 1 lines 61-70) of similar construction to Ringer

except for the presence of a flexible liner. The carton in Henry is not designed as a support, nor is it designed to withstand large compressive forces. There is no teaching in Henry of a support with an end closure system formed from side flaps that will lock permanently when the support is erected.

Ward also discloses a container with an opening for receiving objects. Ward does not disclose a support that is capable of resisting compressive and tensile loads by way of permanently locked end panels formed from side flaps in which one of the side flaps on the end-panel has a quadrant shaped notch and the other side flap on the end-panel has an angular shaped notch, thereby providing a strong, locked end panel which cannot be reopened when the two notches on the side panels interact.

Single discloses a knockdown carton with a manually pre-glued bottom thereby forming a base that can be collapsed for shipment in flat form and subsequently erected by the end user. As in Ward, Single does not disclose a support that is capable of resisting compressive and tensile loads by way of two locked end panels formed from the interaction of two side flaps, one of which has a quadrant-shaped notch and the other of which has an angularly shaped notch.

For the same reasons as outlined in relation to paragraph 3 of the official action, starting with either Henry or Ward, there is no teaching in either of these documents in view of Single and further in view of either Weaver or Forbes which would motivate one of ordinary skill in the art to produce a support with permanently locked end panels. Furthermore, there is no teaching in view of any of the above documents either when considered alone or when considered in combination that would lead one of ordinary

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skill in the art to produce a support with permanently locked end panels by having one of the flaps on the end-panel with a notch which is curved and the other flap on the end-panel having a notch which has an angular surface, thereby producing a support capable of withstanding a considerable load bearing force.

Therefore, it is submitted that claims 1, 2, 4-9 and 11 are also patentable over Henry or Ward in view of Single and further in view of either Weaver or Forbes Jr. as any combination of these documents does not teach or suggest a support in which the end-panels are able to engage and then are not capable of disengaging without destruction of the support.

In paragraph 5, the Examiner has rejected claims 10,12,14 and 15 under 35 U.S. C.103(a) as being unpatentable over Ward in view of Single and either Weaver or Forbes Jr. and further in view of either Rexford or Zimmerman.

The Examiner states that whilst Ward fails to evidence the orientation of the flutes of the corrugated board longitudinally of the blank, that each of Rexford and Zimmerman teach that it is known to orientate the corrugations in a tubular carton blank in the longitudinal direction of the blank. The Examiner is therefore of the opinion that it would have been obvious to orient the corrugations in Ward in the longitudinal direction of the blank as taught by either Rexford or Zimmerman to allow easier folding of the flaps during production and to provide greater crush resistance laterally at the corners of the container.

Applicant respectfully requests that the Examiner acknowledge that in a box that has a top and a bottom, the direction of the fluting will always run from top to bottom. This is due to the fact that this direction is where the main stacking strength of the box is required. In contrast, in the present invention, because the cardboard blank is being used to prepare a cardboard support, having a crash lock system on two opposing sides, the more usual direction of the fluting has been rotated through 90 degrees in order to obtain the compressive strength required of the support. Therefore, in the present invention the fluting of the crash locks end panels runs counter-intuitively. By altering the fluting direction, the tensile strength of the support has been significantly increased with respect to the crash lock end panels.

Consequently, when compressive forces are applied to the top and side walls of the support, the locked notches on the side panels further engage, effectively pulling against one another to further strengthen the support. The greater the compressive force placed on top of the support, the stronger the lock becomes between the notches of the side flaps on the opposing side walls of the support.

A person of ordinary skill in the art of box design would not be motivated to increase the strength of the side panels formed from the side flaps in the direction that has been chosen in the present invention, due to the fact that containers require different load bearing capabilities. The fact that the support is made from corrugated board further increases the supports compressive load bearing capabilities.

Starting with Ward, Ward makes no mention of the direction of the fluting of the material used to make the container (which is not a support). Considering Single, which

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is concerned with a box for transporting vegetables, Single also makes no reference to the direction of any form of fluting in the blank. Likewise, there appears to be no mention of the direction of any form of fluting in Forbes. There is no teaching in any of Ward, Single, Weaver, Forbes, Rexford or Zimmerman of a support. Furthermore there is no teaching in any of these references of a support comprised of cardboard in which the fluting in the erected support runs along the length of the folded panels of the side flaps.

For example, in Weaver, Rexford and Zimmerman, if one were to rotate Figure 2 and Figure 1 respectively through 90 degrees clockwise, one can see that the fluting runs around the boxes towards the opening ends of the boxes/containers. In contrast, if one were to construct a support from the blank as show in Figure 1 of the present invention, with the end panels of the support formed from flaps 11 and 14, and 22 and 25 on the left and right of the support respectfully, one would see that the direction of fluting does not run towards the closed side flaps but instead runs at 90 degrees to the direction of the closed side flaps. This orientation of the fluting also provides the required strength of the support.

There is no teaching in any of Forbes, Weaver, Rexford or Zimmerman of this orientation of the fluting with respect to the closed and locked side panels, in a support as denied in the present invention.

Therefore, the applicant submits that claims 10, 12, 14 and 15 are inventive over Ward in view of Single and further in view either Weaver or Forbes, Jr. and further in view of either Rexford or Zimmerman.

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In paragraph 6 of the Examiner has rejected claims 10 and 12-15 under 35 U.S.C.103(a) as being unpatentable over Ringer in view of either Weaver or Forbes Jr. and further in view of either Rexford or Zimmerman.

In paragraph 7, the Examiner has rejected claims 10 and 12-15 under 35 U.S.C.103(a) as being unpatentable over Ringer in view of either Weaver or Forbes Jr. and further in view of either Rexford or Zimmerman.

As discussed in relation to paragraph 5 of the office action above, in a box or container which comprises a top and a bottom for receiving goods, if the container is comprised of cardboard, the fluting of the cardboard will always run from the top of the bottom of the container in that direction, because that is the direction where the main stacking strength of the box is required. In the present invention, the cardboard support comprises crash lock closures on two opposing sides of the support. As a result, the direction of the fluting of the cardboard is rotated through 90 degrees in order to obtain the compressive strength required of the support, such that the direction of the fluting on the crash locks running counter-intuitively.

By altering the direction of the fluting great tensile strength is achieved for the crash lock side panels, such that when compressive forces are applied to the top and side walls of the support, the locking notches on the side panels pull against each other further. The greater the compressive force placed on top of the support, the tighter the lock between the panels becomes. A person of ordinary skill in the art of box design would not be motivated to increase the strength of the lock between the side panels by way of the nature of the interlock between the notches, or the orientation of the fluting of

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the material of the support, because this would obstruct the re-opening of the container when it was desired to remove the contents.

There is no teaching in any of the references cited in paragraph 6 or paragraph 7 either when taken alone or in combination which would motivate one of ordinary skill man to prepare a support, made from corrugated cardboard with two opposing walls formed from interlocking side panels each comprised of two side flaps with differently shaped notches in which the direction of the fluting of the cardboard runs counter intuitively.

Consequently, applicant submits that claims 10 and 12-15 define an inventive step and are patentably unobvious over Henry in view of Single and either Weaver or Forbes Jr. and further in view of either Rexford or Zimmerman, and furthermore, over Ringer in view of either Weaver or Forbes Jr. and further in view of either Rexford or Zimmerman.

In summary the present application claims a corrugated cardboard support. The support is designed to give massive compressive strength to all external facets. As such, the design of the support is counter-intuitive to the design of a standard box or container, for which the aim is to retain objects within such that the contents do not fall or burst out. All of the references cited relate to boxes, containers, or cartons. There is no teaching in any of the cited references either alone or in combination that would motivate one of ordinary skill to produce a support as claimed in the present invention. Consequently, the applicant respectfully requests that the Examiner reconsider and withdraw the rejections of all of the claims and issue a notice of allowability forthwith.

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This paper is accompanied by a request for a one-month extension of time under 37 C.F.R. §1.136 in which the Office is authorized to charge the undersigned's deposit account 50-1943 for the necessary extension of time.

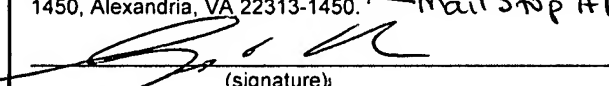
To the extent there is any additional fee required in connection with the receipt, acceptance and/or consideration of this paper and/or any accompanying papers submitted herewith, please charge all such fees to deposit account 50-1943.

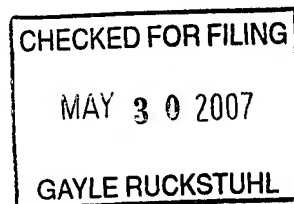
Respectfully submitted,

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<p align="center">CERTIFICATE OF MAILING UNDER 37 C.F.R. 1.8(a)</p> <p>I hereby certify that this paper, along with any paper referred to as being attached or enclosed, is being deposited with the United States Postal Service on the date indicated below, with sufficient postage, as first class mail, in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450. <u>Mail Stop A-1</u></p> <p> (signature)</p> <p>BY: <u>Gayle Ruckstuhl</u></p> <p>DATE: <u>30 May 2007</u></p>



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